REMARKS

Claims 1-20 are presently pending in this application. Claims 1 and 19 have been amended. Reconsideration is respectfully requested in view of the amendments herein and the following remarks.

APPLICANTS' SYSTEM

The applicants' data processing apparatus with replacement keyboard concerns a fabric keyboard of a construction illustrated in Figure 3. Essentially, this consists of conductive planes and the position of a mechanical interaction may be detected by measuring electrical potentials across these planes. Thus, having detected the electrical potentials, it is possible, with reference to a lookup table for example, to identify a specific xy location on the plan which can then be related to a particular key.

Applicants' data processing apparatus is configured to generate data representing displayable characters in response to receiving signals from an input sensor; said signals corresponding to positions o mechanical interactions with said sensor. Processing means are configured to process data derived from the signals from the input sensor including data of a first type corresponding to the position of the mechanical interaction with the input sensor and data of a second type corresponding to the absence of a mechanical interaction with the sensor. Thus, in the embodiment, the apparatus is continually producing a stream of data as described with reference to Figure 13. The first data type corresponds to the position of a mechanical interaction and thereby represents a key character. The second type responds to the absence of a mechanical interaction and thereby the data type preferably represents a null. Thus, the

incoming data stream consists of nulls (no pressure being applied) and actual characters, generated in response to a key being pressed (mechanical interaction).

When the mechanical interactions at different positions with the input sensor overlap in time, the processing means is configured to generate data representing a first character in response to processing a data item of said second type followed by a data item of said first type corresponding to the position of a first mechanical interaction with the input sensor. Thus, the situation of a second type followed by a first type represents a situation in which a null character is being sent and then a keyboard character is sent in response to identifying the mechanical interaction. In addition, the apparatus is configured to generate data representing a different second character in response to processing an item of data of said first type followed by data of said second type corresponding to the position of a second different mechanical interaction with the input sensor.

When the applicants' system is invoked, a typical character stream may be as follows,

Null, null, null, character x, character x, character x, void character, void character, void character, character y, character y, character y, null, null, null.

In the example shown above, key character x is pressed but before character x is released, character y is also pressed whereafter character x is released and then character y is release. The essential feature of the invention is that both character x and character y will be identified separately resulting in the characters being sent for

subsequent processing. Essentially, the applicants' system is capable of detecting the transition from a null to the first character, described in the claim as processing data of said second type (the null) followed by data of the first type (the first character). Furthermore, the applicants' system is capable of detecting the transition from the second character to the null. It degenerates data representing a different second character in response to processing an item of data of said first type (the y character) followed by a data item of the second type, i.e., the null.

The applicants' system thus provides an environment in which a relatively unsophisticated keyboard technology (in the form of conductive planes) is capable of identifying an overlapping key press by in effect identifying the first transition from a null to an actual character position and then detecting the final transition from the second character position to the null when the release takes place.

THE CITED ART

The Examiner has cited US 5,053,589 (Yaniger) and it is submitted that Yaniger does not disclose the invention as claimed. Firstly, it is interesting to note that Yaniger does not produce null characters; therefore, it would not be possible to use the Yaniger teaching withing the environment claimed by the present invention. Specifically, if an input signal falls below a particular threshold, as detected at 214 in Figure 4, the input is ignored, as shown at 216. Thus, Yaniger does not make any use whatsoever of a transition occurring between different data types. Yaniger is only interested in the actual area of coverage that occurs in order to determine whether a valid press has taken place. This is clearly different from the invention as claimed which ignores the

overlapping key press situation as being an invalid signal and is able to identify two separate presses by, effectively, the rising edge of a first followed by the falling edge of a second.

Yaniger, by contrast, uses a substantially more complex keyboard construction in which it is possible to identify the edges of a region over which pressure is being applied. Thus, with Yaniger, it is possible to detect the left upper position of an area of interaction so as to determine whether this represents pressure being applied to the shift key, as required when another key is being shifted. Thus, under most operating conditions, if a detection is made to the effect that an area of interaction is too large (representing two keys being pressed), this situation is ignored. Similarly, if the area of interaction is small enough, a true output signal is produced representing a non-shifted key. The contribution made by Yaniger is that it is possible to detect operation of the shift key when the area of interaction is large. This results in an output being generated representing the shifted key value.

In Yaniger, it is possible to detect the overlapping key press condition, but its method of doing this is significantly different. In particular, the first key press would be detected because the overall size of the press is small enough. When the overlap condition exitss, effectively two of more keys being pressed, either question 226 or question 228 would be answers as "yes", resulting in the input being ignored. Thereafter, the overlap condition is removed by one of the keys being released and again on the next iteration the size of the interaction is small and, therefore, the key press would be detected. The important point to note here is that the Yaniger system is continually looping and distinguishing between conditions of valid key press (possibly

with a shift) and invalid key presses where the area of interaction is too large. The present invention achieves similar functionality but by using substantially less complexity in terms of the mechanical constituents of the keyboard itself. This is achieved by monitoring the arrival of null dta and detecting transitions to a valid key operation or from a valid key operation, irrespective of the degree of overlapping between these two conditions.

The Examiner has also relied upon US 6,532,003 (Nagao). The applicants have experienced some difficulty in identifying subject matter within Nagao that goes beyond that disclosed in Yaniger. It is appreciated that Nagao does show thresholding techniques but there is no reference to receiving data of different types in which a processor looks for a null followed by a position and then looks for a position followed by a null, allowing overlapping key presses to be distinguished by relying upon the data transitions.

Given the scant additional data provided by Nagao, the applicant cannot see how the teachings of Yaniger and Nageo when combined show all the elements of the invention as claimed. It is therefore the applicant's submission that the subject matter as a whole cannot be considered obvious when relying upon these two references in combination.

CONCLUSION

It is believed that all of the stated grounds of rejection have been properly traversed, accommodated, or rendered moot. Applicant therefore respectfully requests that the Examiner reconsider and withdraw all presently outstanding rejections. It is

believed that a full and complete response has been made to the outstanding Office Action, and as such, the present application is in condition for allowance. Thus, prompt and favorable consideration of this amendment is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at (248) 641-1600.

Respectfully submitted,

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By: _____
Gregory A. Stobbs
Reg. No. 28,764

HARNESS, DICKEY & PIERCE, P.L.C.
P.O. Box 828
Bloomfield Hills, Michigan 48303
(248) 641-1600